

UNIVERSITY OF NORTH CAROLINA at ASHEVILLE

MASSIVE OPEN ONLINE COURSES—WILL THEY CREATE GREATER
OPPORTUNITY OR INEQUALITY?

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MASSIVE OPEN ONLINE COURSES– WILL THEY CREATE
GREATER OPPORTUNITY OR INEQUALITY?

by

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is accepted in partial fulfillment of the requirements
for the Master of Liberal Arts degree at
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Abstract

Massive Open Online Courses (MOOCs) have the potential to be a “disruptive innovation” which will change higher education. This paper examines the likely outcomes of the introduction of MOOCs for students and faculty. Previous distant learning efforts using radio and television failed to have a major impact on the structure of higher education. MOOCs are different. They are available free to anyone in the world with a broadband connection, the interactive capabilities of the internet adds dimensions not available in earlier technological attempts, and they arrive at a time when the current model for higher education is out of step with the demands of modern society. MOOCs will not destroy brick and mortar universities or community colleges, rather their introduction will lead the higher education establishment to modify the premise of what a liberal college education entails, to one that matches the needs of the modern world. Those needs include life-long learning programs, flexibility in time and place by means of “blended” instructional environments.

Introduction

Massive Open Online Courses (MOOCs) have the potential to be a “disruptive innovation” that will change higher education (Christensen). MOOCs arrive at a time when the value of a college education is in question. Decreases in state funding to public colleges and universities contribute to increases in tuition costs (Bowen). High dropout rates and longer “time to degree” have left students burdened with onerous debt obligations; while average graduates salaries have fallen (*Business Insider*). Employers complain many graduates are poorly prepared for the workplace. MOOCs offered by elite universities hold the promise of reducing the cost of higher education, and at same time offer the possibility of improved student learning outcomes.

The prospect of moving public higher education instruction from brick and mortar campuses to a one-size-fits-all online pedagogy kicked off a heated discussion on whether MOOCs offer the opportunity for less privileged students to get a first-class education, or if their adoption would lead to a two-tier education system and possible bankruptcy for many public colleges and universities.

This paper examines both sides of this debate, and argues that MOOCs will not destroy brick and mortar campuses, but provide a basis for learning outcomes better suited to the needs of modern life. Those needs include life-long learning programs, increased classroom interaction, flexible learning environments and new education pathways.

Massive Open Online Courses are a powerful data mining tool for education researchers to track and study effective student learning practices. This reevaluation of higher education may result in an education system similar to that operating in Northern

Europe, offering multiple pathways both vocational and academic geared to the abilities and needs of students at different stages of their lives.

Globalization of Elite American Colleges and Universities

American higher education is the envy of the world. In the annual Academic Ranking of World Universities; 8 of the top 10 colleges and universities in the Shanghai Jiao Tong University rankings, 11 of the 20 highest-ranked in the Quacquarelli-Symonds rankings, and 76 of the top 200 in the Times of London rankings are from the United States (Appendix 52). No other country comes close to matching this dominance.

Ivy League schools are revered around the world. The cream of academia staff their faculties, attracting the brightest and wealthiest students from the U.S. and overseas. Acceptance rates at top schools vary from a low of 6% at Harvard to a high of 13% at the University of Chicago (*New York Times* "Acceptance"). Graduates from elite universities command impressive salaries. Holders of an MBA from Harvard or Stanford can expect to earn between \$187,000 and \$194,000 within three years of completing their studies (*Financial Times*). This is true in the fields of industry, politics and law. All the Justices of the Supreme Court attended top schools, over a quarter of all Senators graduated from Ivy League universities. It is the same in science and medicine. University of California Professor William Domhoff, author of "Who Rules America", describes an elite groupthink which, "plays out in terms of social networks, cultural/social capital, and a feeling of being part of the in-group" (Schwartz).

The global franchising of elite U.S. universities is underway. Yale has established a campus in Singapore, Yale-NUS, Cornell and Georgetown, opened a Medical School and School of Foreign Service respectively in Qatar, NYU has campuses in Abu Dhabi and

Shanghai and MIT is setting up Skoltech in Moscow (George and Sebenius). Massive Open Online Courses (MOOCs) offer the opportunity for these Universities to market and promote their institutions, curriculums and faculties on an unprecedented global scale. Anyone with a computer and broadband access can subscribe for free to courses on Coursera, Udacity, edX and other MOOC platforms. Harvard professor Michael Sandel has attained celebrity status. His course Justice X has over twenty million views in China, prompting *The China Daily* to note that “Sandel has the kind of popularity in China usually reserved for Hollywood movie stars and N.B.A. players” (Friedman). The author went on to note that Sandel lectured to 14,000 Koreans and his popularity was such, he was given the honor of delivering the opening pitch in the Korean baseball season. For the teaching staffs at elite “brand” name universities and colleges MOOCs are an opportunity for fame and fortune.

But for the vast majority of faculty without the name recognition or resources of Ivy League and elite Universities there is concern and apprehension.

A Threat to Public Colleges and Universities

State Universities and community colleges receive most of their funding from state governments, student tuition, grants and donations (Tierney and Hentschke 77). Most lack the endowments and research funds available to Ivy League schools. The financial crisis of 2008 created short falls in state budgets, this combined with increasing tuition costs, put pressure on state and community colleges to do more with less. Later in this paper, we will examine the reasons for the rising costs at these institutions. MOOCs offer the promise of reducing these costs.

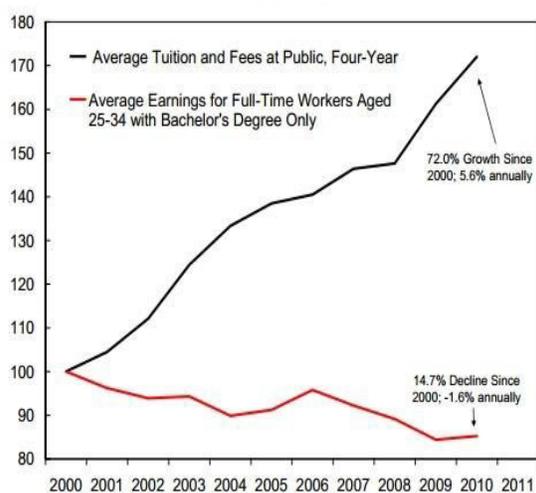
Massachusetts Bay Community College with a grant from the Bill and Melinda Gates Foundation undertook a trial program in the 2012-13 academic year using a computer-

science MOOC from edX. At the end of the semester, the students who passed the class received three credits from Massachusetts Bay and a certificate from edX. Chandrakant Panse, a professor of microbiology, and president of the teachers union chapter is quoted as saying “the MIT certificate has a lot more value in the marketplace than three course credits at Mass Bay” (Kolowich “Outsourced”).

The Department of Philosophy at San Jose State takes a different view of the Michael Sandel Justice X pilot MOOC agreement between their university and edX. In an open letter, they explained the reasons for their refusal to be part of the pilot. “We believe that long-term financial considerations motivate the call for massively open online courses (MOOCs) at public universities such as ours. Unfortunately, the move to MOOCs comes at great peril to our university. We regard such courses as a serious compromise of quality of education and ironically for a social justice course, a case of social injustice” (Kolowich “San Jose”). The writers went on to detail their objections; first is “what sort of message are we sending our students if we tell them that they should best learn what justice is from listening to the reflections of a largely white student population at Harvard”, San Jose State has a very diverse student population, with a large percentage of Hispanic students from less privileged backgrounds. Their second objection is the threat of a two-tier education system; “one well-funded colleges and universities in which privileged students get their own real professor; the other financially stressed private and public universities in which students watch a bunch of video-taped lectures”, they summed up their objection with a paradoxical statement “teaching justice through an educational model that is spearheading the creation of two social classes in academia thus amounts to a cruel joke.”

For the staff at thousands of non-profit higher education institutions around the country, the introduction of MOOCs offers the potentially bleak possibility that their role as educators is diminished. Students, many from less privileged backgrounds, will receive an “education on the cheap.” In society, there will be greater inequality, a divide between a small cadre of well-educated mostly wealthy elites and poorly educated masses.

A Looming Student Debt Crisis in Higher Education



Sources: College Board, U.S. Department of Education, Census Bureau, and Citi Research. Note: Both tuition and earnings were weighted in 2010 dollars, and tuition and fees were enrollment-weighted.

Figure 1 (Business Insider)

There is a student debt crisis in higher education. A study by Citi Research shows that, from 2000 to 2010, the average cost of tuition at public four-year colleges rose by 72%, at an annual rate of 5.6% (Figure 1). Since 1983, the cost per student has risen at five times the rate of inflation (*The Economist* “Lessons”). Thirty-seven million Americans owe combined student loan debt of one trillion

dollars. Of those one trillion dollars, \$864 billion is owed to the U.S. Government, the rest mostly to seven private lenders (Moore). The average student loan debt is \$24,301. Like the earlier subprime mortgages, it is collateralized debt, traded on stock markets. Tuition has risen as the state appropriation share of total receipts fell from 44% to 22% between 1980 and 2009 (Bowen 19). Net tuition, that is the amount paid by students, rose from 23% to 43% in the same time period. Deteriorating family circumstances leads to students taking out larger loans.

The increase in student debt is only partially due to increasing tuition costs. Compounding the problem is “time to degree” and completion rates. Public universities have a completion rate of 55% in six years (Bowen 119). This is due in part to student preparation, requiring colleges to offer remedial courses to get undergraduates up to speed. MOOCs have the potential to address student preparedness for college. Bill Gates, co-founder of the Bill and Melinda Gates Foundations promotes using MOOCs to help struggling students in remedial mathematics (Mangan).

There is also an economic component, students forced to take part time jobs to pay for tuition are taking longer to graduate. The 2012 National Survey of Student Engagement report shows, 32% of freshmen, 36% of seniors and 60% of full-time students working over 20 hours a week at a part-time job report that financial concerns interferes with their academic performance (NSSE 2). A study by Sarah Turner of the National Bureau of Economic Research found that those requiring longer times to graduate were concentrated at colleges with the least resources to offset net tuition (Bowen 38). Meanwhile as student debt increases, salaries for graduating students declined by 14.7% (Figure 1).

Declining Return on Investment for College Degrees

The reasons behind the drop in salaries for some graduate fields are complex. They include:

- Globalization, which creates a larger pool of talent, driving down the cost of labor.
- Labor saving innovation, that eliminates entry positions.
- Employers’ complaints that the education provided to students at universities is leaving graduates unprepared for the workplace to justify the higher salaries.
- A dynamic marketplace with rapidly changing needs.

Thirty percent of the American population now has degrees. In areas such as law, there are too many graduates for the available positions. However, there are shortages in other sectors, such as healthcare. Experts estimate a current shortage of 16,000 primary care physicians needed to meet the medical needs of the aging baby boom generation. The Association of American Medical Colleges predicts a general shortage of 130,600 physicians by 2050 (Koba). At the same time, The Bureau of Labor Statistics shows that there are a million retail-sales clerks and 115,000 janitors with four-year degrees. In 1970, just two-tenths of one percent of taxi drivers had college degrees but now fifteen per cent hold a four-year degree (Carlson “Payoff”).

What is common to these and other issues is that the dominant academic model for U.S. higher education, developed in the late 19th and early 20th century, summed up as; “the best type of liberal education in our complex modern world aims at producing men (and women) who know a little of everything and something well,” appears less applicable to the realities of the 21st century (Christensen and Eyring). This is why, unlike other distance learning attempts, the timing, reach, interactive and data-mining capabilities of MOOCs threaten to be a disruptive innovation that can change the structure and calculus of higher education.

Anglo/American Higher Education Paradigm

The current dominant model for higher education is one developed over time by Harvard University.¹ The man most responsible for the structure of the modern university

¹ The initial benefactors and teaching staff of Harvard were former students from Cambridge University in England, including a certain John Harvard who left half his estate and a library of the books to the new university upon his death in 1638. The school’s mission at the time was to train ministers for religious service. In 1701, John Leverett was made head of Harvard. To broaden the appeal beyond its Puritan mission, Leverett introduced new courses in mathematics and natural philosophy, what is today known as science. At the turn of the nineteenth century, Unitarians captured the presidency, moving the University even further from its

system is Charles Eliot. In 1868, he was made president of Harvard. Three years earlier, after a two-year stint spent in France and Germany, he formulated three goals for universities: first, to excel in all academic disciplines with an emphasis on advanced studies, second, to contribute to the social and economic welfare of society and third, to provide freedom to choose the curriculum. Upon assuming the post of president, he introduced “the Elective System.” Professors would be allowed to choose what they teach and students to choose what they wanted to study. Eliot understood that the elective system involving a broad palette of courses would be expensive; but Harvard was rich in endowments.

His next initiative was to promote excellence by creating advance degrees including the Ph.D. This not only allowed students to study specialized fields in depth, but those same graduate students could handle much of the teaching load, freeing professors to concentrate on research. Eliot championed freedom of academic inquiry and speech, introduced a system of tenure and established the tradition of faculty involvement in university administrative decisions. Eliot’s reforms extended to secondary education. Private prep schools could no longer provide enough students to fill the expanding course options at Harvard and other colleges. Initially, Eliot was in favor of a multi-level high school system similar to that in Germany. Persuaded that the German system would discriminate against late bloomers, he pushed for what he called “mental training” and standardized exams. This put public high schools in the situation of having to prepare academically-inclined students for college and students with a technical or vocation inclination for the workplace. Tasked with two different functions and limited resources, public high school struggled to perform both well, an issue that is still with us today (Christensen and Eyring).

Calvinist roots. In 1825, student unrest led Harvard president John Kirkland to allow students *to choose a subject* in place of Latin or Greek. At the same time the curriculum was turned over to newly created faculty departments. Generous gifts from wealthy alumni allowed the university to hire better qualified faculty.

Subsequent Harvard presidents modified the elective system and broadened the number of advance degree courses. One key feature of the traditional college model is the breadth and specialization of the course catalogues. These courses require large teaching staffs and the facilities to house them. Costly, competitive intramural sports programs, scholarships to attract high performing students, financial aid, expensive outreach and recruitment add to this breadth and specialization. The model “bigger is better” requires constant expansion and ever-increasing capital. Ivy League universities manage this because they have large endowments and highly ranked universities get a disproportionate percentage of research grants, this is not true for most public universities and community colleges.

The Rising Costs of Public Higher Education

A report by the National Center for Public Policy and Higher Education found that between 1982 and 2007 published college tuition and fees adjusted for inflation increased 439 percent (Lewin “Unaffordable”). The rising costs of public education has less to do with increases in faculty salaries, though they rose faster than many other professions, but with large investments in facilities and equipment, financial aid to low income students and new services for students. Attracting the best and brightest requires not just highly regarded professors, but also state-of-the art laboratories and sound-designed auditoriums. Students expect comfortable lodging, the latest gym equipment, cafeterias with expansive menus and numerous other services. While costs have risen, state per-student funding at public research universities has fallen 15%. The drop in government higher education funding is largely due to increases in government healthcare expenditure. In 1987, Medicaid received slightly more than 10% of state spending and higher education slightly more than 12%. By 1999, Medicaid

spending increased to 19% and higher education dropped to 10% (Tierney and Hentschke 40).

Trying to contain and reduce these costs is problematic, as it is difficult to quantify outputs and inputs. The broad goals of a liberal education are such that policy makers do not even know what it is they are measuring (Bowen 6). For example, if a student on graduating decides to work for a NGO overseas and gets paid a stipend, is that a success in terms of experience gained or is the low financial remuneration received a measure of failure? The problem faced by university administrators can be likened to the famous observation “you can see the computer age everywhere except in the productivity statistics.” How does a bank quantify the cost benefits in convenience of adding an ATM? (Bowen 7). Further, as a labor-intensive industry staffed by specialists, there are limited efficiency innovations other than firing staff to bring down costs. Unlike corporations, where staff can be moved around to different departments, the very nature of the academic enterprise has a built in rigidity. It is not possible to shift a psychology professor to the physics department and expect him or her to teach an undergraduate or advanced course. An institution would lose its accreditation.

Paradoxically, the financial crisis in higher education comes at a time when information and knowledge is at a premium. Education is a growth industry. In 2013, California had 470,000 students on a waiting list for community colleges (Rivera). The response of the California State Legislators is Senate Bill 520, sponsored by State Senator Darrell Steinberg. It calls for establishing a statewide platform through which students who have trouble getting into certain low-level, high-demand classes could take approved MOOCs offered by providers outside the state's higher-education system. (Gardner and Young). The Bill raised vehement opposition from the University of California, California

State University and Community Colleges systems. Their argument was simple; stop cutting funding to education, start investing in education. The Bill passed 28-0 (Meyers). Its implementation is on hold until the summer of 2014. The three higher education systems put forward plans to create their own on-line courses to help reduce the waiting list. California State University offered 36 online courses for the fall of 2013 that could be taken for credit by students at any of the system's 23 campuses (Kolowich "California").

From the 1950s through the 1970s, California set the standard for public higher education. Now, there is widespread political and public skepticism that the system is up to the task. In a 2011 study of 2142 adults 18 and older by the Pew Research Center called "Is College Worth It?", 57% respondents said Americans were not getting "good value" for the money they spent on a college education, 75% of respondents said it was too expensive. Only 19% of college presidents said the U.S. system of higher education is the best in the world now, and just 7% said they believe it will be the best in the world ten years from now (Pew Research Center). What changed? America changed.

Changing Economic Climate

The purpose of a traditional college and university education is to prepare students to be good citizens with critical thinking skills. The communal aspects of a higher education were intended to make a better union, a better democracy, a better country. Parents see it a little different, 70% see the priority as "to prepare a student for a career" (Tierney and Hentschke 35).

After World War II, the only major Western nation with a functioning large-scale industrial infrastructure was the United States. The demand to rebuild and supply the rest of the world guaranteed a virtual monopoly in durable goods and food. Companies were

anxious to make sure their employees were taken care of. It was expensive to train them and there was no shortage of work. Further, the perceived spread and threat of the Soviet Union, a supposed workers' paradise, meant that the captains of industry were always looking over their shoulder. In effect, a social contract existed: in exchange for taking care of its employees, a company earned their loyalty (Hendry). This communal sense contributed to widespread public support for the civil rights, feminism, environmental activism and other movements through the 1960s and 70s. Students on college campuses were actively involved in supporting these changes.

The Rise of Global Neo-Liberal Capitalism

The social movements of the 60s brought about unwelcome cultural changes for many Americans. In the late 1970s and early 80s, disillusionment set in. The U.S. economy faced competition from resurgent Japanese and German industries. American manufacturing fell into decline. One bright spot in this economic malaise was the emerging computer industry in Silicon Valley, California and Redmond, Washington. Substantial fortunes were made by creating software, applications and micro-electronics. These industries were entrepreneurial with a culture of hiring the brightest and the best. By their very nature, entrepreneurs are focused on creating a personal fortune. Employees at Microsoft, Apple, Intel, Cisco and other computer, electronics and software companies became millionaires overnight. With capital, contacts and know-how, many became investors and venture capitalists in new start-ups. By 1990, education was perceived as less of a public good, but a route to financial success. States used the leverage of their higher education institutions to entice companies to relocate or entrepreneurs to create start-ups as part of their economic development strategies. International events added to this sense of urgency.

The fall of the Berlin Wall and the collapse of Communism in the late 1980s unleashed global free-market neoliberal capitalism. The restraining influence of an “expanding workers’ paradise,” the introduction of the internet, computerized trading, the move towards a “New World Order” and globalization announced by President H.W. Bush changed the social contract between corporate employees and management. Shareholder profits were the primary mission of management (Hendry). Employees were on their own, acting as competing free agents. Companies cut benefits and their staff then rehired employees as independent contractors on an as needed basis, creating a class of professional known as “permalance” (Perlman). By 2000, the endless quest for profits led to outsourcing operations overseas. According to Forbes magazine, from 1999 to 2008, over 42,000 factories closed. On average, 50,000 jobs vanished every month (Thompson).

Accompanying the decline in the notion of the economic common good was the rise of the financial sector. Investment bankers and stockbrokers made fortunes for shareholders and themselves using junk bonds, leveraged buyouts and other innovative financial vehicles.

Graduates from the top schools received large salaries to use their data analysis skills and mathematical expertise to create algorithms for computer trading programs. A college education in mathematics, computer science and electronics was a ticket to wealth.

Graduates flooded into MBA programs to burnish their business credentials.

Accelerating Rate of Innovation

Contributing to the changes in the social contract between companies and employees is an accelerating rate of change in innovation. Television sets became commercially available in the mid-1930s; it was not until the mid-1950s that cumulative worldwide sales

for television sets reached 50 million. By comparison, the I-pod released on November 10 2001 sold its 100 millionth unit on April 9 2007 (Apple Computer).

The accelerating rate of new innovations creates the need for people to continually update skill-sets. The top ten job openings for 2008 required, in part, skill-sets that did not exist in 2004. The rate of technological advances in biotechnology, robotics, nanotechnology and the IT industries demands continuing education, for employees to stay relevant in their respective market sectors. Higher education faces a challenge of educating students for technologies that in some case do not exist, but will in the future. The current structure of traditional higher education driven by faculties and departments has been slow to find solutions. One answer to the growing need for continuing higher education is for-profit colleges and universities.

For-Profit Colleges and Universities

Harvard developed its academic model for the Industrial Age. Education in the early decades of the twentieth century through the post-World War II era assumed that most students after graduating from university would join a company or enter public service, be trained and become a life-long employee. Essentially, for most graduates further education would come from adapting to gradual innovations, attending industry based conferences and seminars, backed by years of hands-on experience. This worked for the Industrial Age, when change happened at a slower pace; but in the Information Age, knowing “something well” means continuous life-long education. This is reflected in the demand for higher education: adults older than 25 represent more than 50% of the potential post-secondary student population growth. Between 1987 and 2000, the number of post-secondary students in the 25-44 age bracket increased by 23%, from 4.9 million to 6 million. What this growing post-

graduate segment wants from higher education is very different from that offered by university campuses, “members of this significant sector want customer-focused curricula enabling them to receive job training and requisite skills.” For-profit colleges and universities (FPCUs) fill this need, and do so very profitably. From 1998-2003 enrollments in FPCUs increased 80% in less than four years (Tierney and Hentschke 29). In 2009, Standard & Poor’s added the FPCU conglomerate DeVry Inc to the S&P500 index, replacing General Motors (DeVry).

FPCUs represent a fundamental shift in basic assumptions about higher education. FPCUs are not a collegial undertaking where faculty controls the curriculum and is a partner in administration. FPCUs are business entities. The curricula are minimalistic and career-focused; faculty is work for hire with little or no tenure, and resources are directed towards courses, marketing and sales.

There is much to learn from the expansion and structure of FPCUs that can be applied to making MOOCs a viable business proposition and a valuable educational tool. Of the twenty-one million students enrolled in post-secondary education in 2009, over 10% attended for-profit universities (Figure 2). In the 2010-11 academic year, total revenues, in current dollars, at postsecondary degree-granting institutions, were \$324 billion at public institutions, \$207 billion at private nonprofit institutions, and \$28 billion at private for-profit institutions (NCES “Condition”).

Fall 2009	Total Enrollment	FPCU Degree	FPCU Non Degree
Total	20,966,826	1,851,986	387,040
4-year	12,906,743	1,466,792	45
Males	5,573,046	527,811	11
Females	7,333,697	938,981	34
2-year	7,674,744	385,194	82,306
Males	3,271,579	134,018	39,690
Females	4,403,165	251,176	42,616
<2-year	385,339		304,689
Males	107,952		74,073
Females	277,387		230,616

Figure 2 (NCES “Fall 2009” 7)

There are over 9,400 post-secondary institutions in the U.S., 47% are organized as for-profits. They are the fastest growing segment of the post-secondary market. Most FPCUs are small, enrolling only a few hundred students. Keeping campuses small allows FPCUs to locate programs to meet market demand. While the campuses are small, some mere rooms in an office building, the size and market profile of the companies vary considerably, ranging from large publicly traded entities in excess of \$100 million capitalization, to smaller privately held firms with revenues between \$50 to \$100 million, down to the vast majority, which consist of small targeted education services, such as language and trade schools (Tierney and Hentschke 50-58). Within the large publicly traded FPCUs, numbering about ten, each has carved out a distinct marketing profile (Table 1).

Apollo Group:	Working adults for bachelors in business, technology and education
DeVry:	Over 90 campuses in the U.S. degrees in science, technology and business
Strayer:	Over 100 campuses, degrees in criminal justice, healthcare, and business
Education Management Group:	Focused on art, design, culinary arts, health services and education
Capella:	Mainly masters and PhDs student have a choice of 1690 online courses.
Corinthian:	Shorter-term courses in allied health, IT, auto repair, and business
Kaplan:	Accredited online law degrees
Universal Technical Institute:	Working closely with corporations in the transportation market space
Laureate International:	Over 70 International campuses in art, education and health services
National American University:	Degrees in business, healthcare, IT, accounting and criminal justice

Table 1

Their growth is not limited to the U.S. The University of Phoenix, part of the Apollo Group, has campuses in Brazil, India, Mexico, Chile and China. At their Rotterdam facility, students can earn an accredited U.S. MBA. Corinthian has forty-five colleges and fifteen training center in Canada. DeVry has campuses in Canada, Eastern Europe and Central Asia, as well as a medical school in St Maarten. Overall, domestic and overseas acquisitions account for nearly half of for-profits' growth in enrollment. These acquisitions are possible because of readily available access to investment capital. That is only half the story;

enrollment at existing sites has been increasing too. What are they offering that these students need?

FPCUs Education Structure

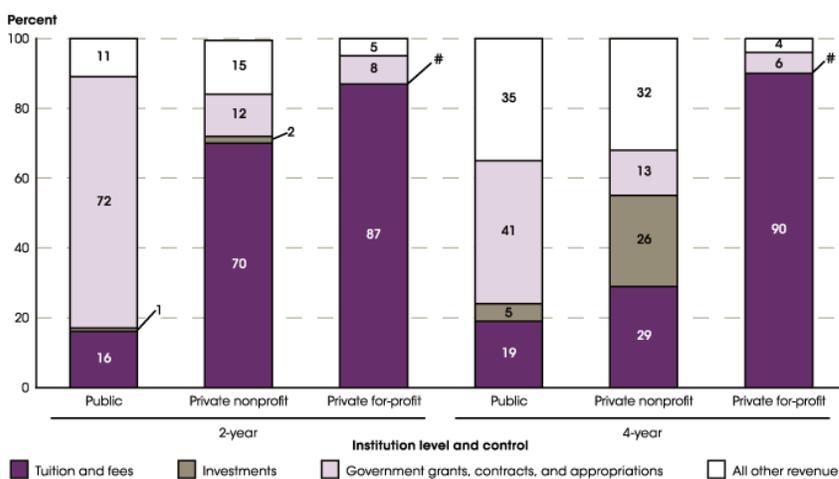
At traditional academic institutions education is regarded as a public good. The primary concern is academic freedom and a search for excellence and truth (Tierney and Hentschke 20-25). Prestige matters. The curriculum is faculty driven. San Jose State University Philosophy Department's criticism of the edX MOOC Justice X is that lectures were not designed for its diverse student body. The concept of a one-size-fits-all curriculum is viewed as a direct attack on academic freedom. Quite the opposite is true for FPCUs.

The core mission of FPCUs is employment training for profit. Companies like Charles Schwab have created "universities" to train their personnel in how to use company tools (Southall). The online course, not open to the public, is similar to a MOOC consisting of twelve sections that take 30 to 60 minutes to complete. McDonald's operates Hamburger University offering employees the opportunity to earn ACE recognized college credits (McDonald's). Overall, corporate America spends between \$50-70 billion training their workforce. Some of it is outsourced to FPCUs. Cisco certification training is offered at the University of Phoenix, DeVry, Technical Institute of America and other for-profits. Testing is managed by Pearson VUE. The multiple certifications allow for technicians to operate at many levels in different areas of internet architecture. As of March 2, 2013, according to Cisco, there were 38,005 technicians classed as Expert, representing an increase of 43% from the 2012 Expert CCIE certification of 26,634. The differences in certifications are related to the salary a technician can command. The mean salary difference between a CCDA (Cisco Certified Design Associate) \$94,799 and a CCNASP (Cisco Certified Network Associate

Service Provider) \$83,549 is \$11,250, though both are Associates (Global Knowledge Training). This type of cost-benefit return on investment (ROI) is the central selling point for FPCUs.

FPCUs have two yardsticks of success, both measureable and both intertwined: enrollment and placement. The courses offered are co-produced by the multi-disciplinary collaboration of upper management at FPCUs and representatives of prospective employers. Some of the instructors are hired from those same employers. Once created, a course is then offered at other campus locations. The role of faculty is to teach to the course. This corporate franchising spreads the costs associated with the course, the more campuses that offer the

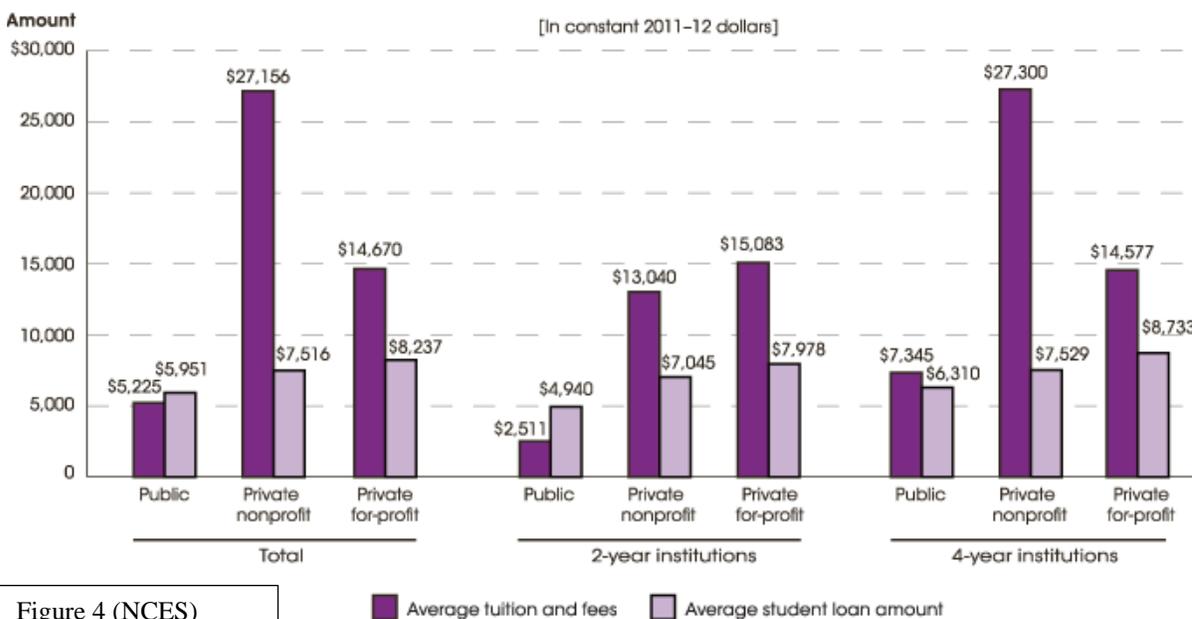
Figure 3 NCES



program, the higher the enrollment, the greater the profitability. Unlike public colleges and universities, FPCUs receive between 87-90% of their income from enrollment (Figure 3).

Students who attend four-year FPCUs tend to be older than less-than-four year FPCUs and traditional public universities. Most are working adults and courses are “blended” between in-class and online components to meet the 50-50 rule. Classes are scheduled mostly in the evening with opportunities to catch up, if students fail to attend. The focus is to accommodate the student. FPCUs claim that they offer a minimum of 70% placement for those that finish a proscribed course. Those figures are disputed (CBS News). What is not in

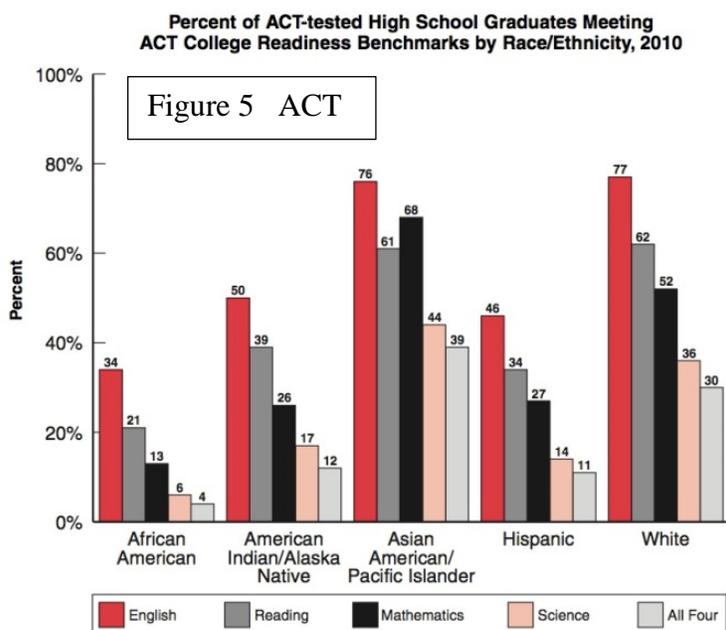
dispute are completion rates. At four-year for-profits, only 42% of students complete their course work in six years compared to 57% at public four-year colleges. The completion rates for two-year associates’ degree are higher—62% compared to 29.2% at community colleges (NCES “Condition”).



The cost of tuition at four-year for-profit universities is half that of private non-profit colleges. For the 2011-12 academic year those figures are \$14,670 and \$27,156 respectively, considerably higher than public universities \$5,225 (NCES “Condition”). The low completion rates and higher tuition at four-year for-profits contribute to a higher student debt default rate of 13.6%. The average default for all student loans is 9% (Figure 4).

Adults over twenty-five looking for skills training are one large segment of the for-profit post-secondary education marketplace; other sizeable segments are military personnel on assignment overseas and minorities. Low-income minority households, with students taught in poor performing high schools, find it increasingly difficult to pursue an advanced education in prestige-driven institutions. Black and Hispanic students make up 52% of

enrollments at two-year for-profits and 42% at four-year entities. Many of these minority students are first generation higher education students. The students often lack the preparation and discipline to master the work (Figure 5).



In the 2010 ACT College Readiness Benchmarks tests (English, Science, Reading and Mathematics), only 4% of Black students, 11% of Hispanic met all four benchmarks compared to 39% of Asian and 30% of non-Hispanic white students (ACT).

Criticism of For-Profit Colleges and Universities

For the 2010-11 academic year, 73% of students at for-profits received Federal grants and 83% received student loans (NCES “Condition”). In the past, access to Federal funding led to rampant abuse in FPCUs, forcing Congress to institute the 90/10 rule. No more than 90% of funding can come from Federal grants. This raises important questions about the viability of FPCUs. Critics point out that taxpayer funds are being syphoned to private investors. A U.S. Senate Committee on Health, Education, Labor and Pensions two year investigation of the thirty largest FPCUs found that, FPCUs devoted 22.4% of all revenues, or \$4.1 billion to marketing, advertising, recruiting and admissions staffing; 19.4%, or \$3.6 billion, to profit; and 17.7%, or \$3.2 billion, to student instruction. The average CEO salary was \$7.3 million in 2009, more than seven times the average salary of large public university

presidents (US Senate HELP Committee). In response, FPCUs claim they are meeting a market need and serving a disadvantaged and underserved market.

Can MOOCs replace the role of FPCUs?

The economic arguments made for FPCUs are many of the same that can be made for MOOCs.

- MOOCs allow access to underserved student populations, but on a global scale.
- MOOCs allow for flexible life-long learning.
- MOOCs use standardized one-size-fits-all model presentations.
- MOOCs focus on student learning, requiring no large outlays on facilities.
- MOOCs are a market-driven solution with measureable outcomes.

For this reason MOOCs made by prestigious Ivy League schools and elite State universities and colleges represent a serious challenge to the viability of For-Profit Colleges and Universities. MOOCs from these institutions have a very important edge not available at any price to FPCU—their stellar reputations. This is most evident in the area of accreditation. FPCUs face criticism from accrediting agencies for their lack of shared governance. In July 2013, the University of Phoenix, the largest accredited university in the U.S., was put “on notice” for two years by the Higher Learning Commission of North Central Association of Colleges and Schools (Kelderman and Blumenstyk). The Commission’s concerns were related to the university’s independence from its parent company, the Apollo Group and that the faculties teaching at doctoral level “have a recognized scholarship, creative endeavor or achievement in practice commensurate with doctoral expectations.” Similar doubts were expressed for a smaller institution owned by the Apollo Group, Western

International. Other concerns noted were student-retention, graduation rates, student-loan defaults rate and how credits were awarded.

In August 2013, President Obama gave a stinging rebuke to FPCUs. He told an audience at Syracuse University in Binghamton, New York; “at some for-profit colleges, students are loaded down with enormous debt, they can't find a job. They default. The taxpayer ends up holding the bag. Their credit is ruined, and the for-profit institution is making out like a bandit. That's a problem" (Blumenstyk). The President went on to outline his plan for reforms in higher education to make sure students get value for their tuition, remarking "There are probably more problems in the for-profit sector on this than there are in the traditional non-for-profit colleges, universities, and technical schools, but it's a problem across the board."

FPCUs view this type of oversight as an attempt by the non-profit traditional university and colleges system to prevent their approach to education gaining traction. FPCUs regard this as an obstruction to the necessary “disruptive innovation” needed to make higher education relevant. What they regard as relevant education is providing skills training that lead to employment. That is a possible role MOOCs overseen by traditional universities and colleges can play in offering improved opportunity to students from disadvantaged background.

Preparing Students For the Workplace and Life-Long Learning

A 2013 survey by *The Chronicle of Higher Education* and *American Public Media's Marketplace* revealed that half the employers said they had trouble finding qualified graduates to fill positions. One-third gave colleges fair to poor marks preparing students for the workplace (*The Chronicle of Higher Education* “Employment”). Their grievance is not

with technical abilities, “but knowing how to think.” Particular criticism is directed at poor communication, decision making and analytical skills. Critical thinking skills are the stated goals of a traditional academic education. There is a difference in meaning as to what constitutes critical thinking skills in academia and industry. The latter can be better termed as “thinking on your feet skills,” the ability to solve real-world problems in a short time. Traditional colleges and universities mostly brush off this criticism and with some justification. It is not their mission. The goal of higher education is to educate broadly in an academic sense, not solve specialized problems. It is the responsibility of companies. Due to the increasing rate of change in innovation and employment mobility, businesses are less willing to invest in the necessary training of recently hired graduates.

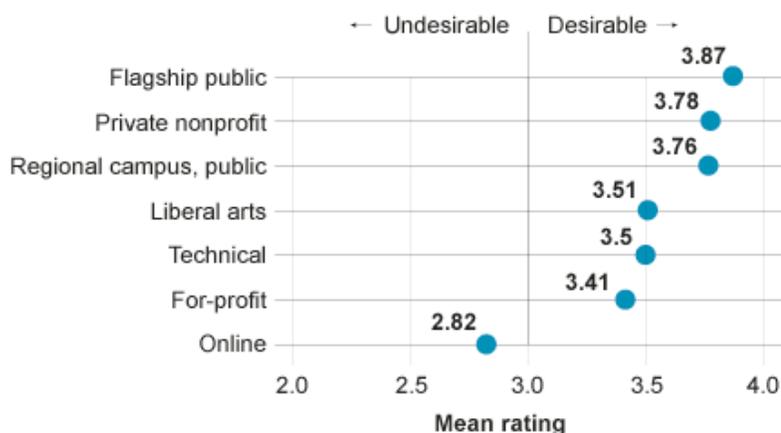
Nevertheless, state and federal governments regard higher education as an important component of economic development. Even though the taxpayer portion of higher education has decreased and companies have the financial resources to pay for training, government puts the onus on higher education to prepare students for the workplace. “The mantle of preparing the workforce has been passed to higher education,” says Philip Gardner, Director of the Collegiate Employment Research Institute at Michigan State (*The Chronicle of Higher Education* “Employment”). A possible economical and practical solution to address this situation is Massive Open Online Courses.

MOOCs and Higher Education

Currently, employers hold online courses in low regard (Figure 6). Of 600 companies, 56% stated they preferred graduates of traditional colleges while only 17% preferred online education (Winston). Accredited online programs are mostly run by FPCUs, though education certificates and other qualifications are offered by a few traditional campuses.

However, employer perception can change — if accredited MOOCs are offered by prestigious universities, technical colleges and reputable community colleges. Further, if those institutions chose to take up the “mantle” of job training using MOOCs either as online instruction or as part of a “blended” curriculum for continuous life-long learning in a cost effective manner, integrating “thinking on your feet skills”, “blended” education can become a long-term revenue stream for cash-strapped colleges.

Employers Prefer All Types of Colleges— Except Those Online



Note: Mean rating is determined on a 1-to-5 scale where 1 equals “a lot less” and 5 equals “a lot more.”

Figure 6 The Chronicle of Higher Education

Incorporating MOOCs

in this way should not be seen as diminishing the current structure of higher education, but extending its role and reach. This will require new types of partnerships, similar to the one discussed earlier involving Massachusetts Bay

Community College and edX. Technical and community colleges are focused either on preparing their students for the workplace or for transfer to university. While employers gripe about students not being ready to hit the ground running, the reality is that most university graduates are over educated for the tasks expected of them in business and industry. The Georgetown Center on Education and the Workforce has forecast that, even in the second decade of the 21st Century, most job openings will not require a B.A. or an advanced degree. Greg Kundahl, the former CEO of the Center of Innovation for Nano

Biotechnology in North Carolina put it succinctly, “What we need are not PhDs but more associate degrees” (Kundahl) . This is reflected in earnings, 83% of workers with associate degrees earn the same as workers with bachelor degrees (Tierney and Hentschke 115). The types of openings employers in nanotechnology want to fill are operators of robotic assembly plants. The skills needed are training in computer programming, as well as mechanical skills such as repairing parts. This know-how requires a specialized blend of academic and vocational training, more than a high school diploma, but less than four-year degree. As improved software and new innovations become available, operators need to upgrade their skills. This should be one of the roles of higher education in 21st century, one ideally suited to MOOCs. MOOCs offer the flexibility to allow employees to keep working, while still educating themselves on the new generation of software and hardware innovation. Ideally, it is the responsibility of the employer to fund that ongoing education. As noted earlier, this is already partially true for various IT businesses such as Cisco and Microsoft. They pay for training existing employees. Currently, to be eligible for consideration, applicants seeking technical positions at Cisco and Microsoft have to pay for education and certification out of their own pockets or get loans to cover the tuition costs.

Higher Education Skepticism

Integrating lifelong online learning using MOOCs at traditional higher education is fraught with challenges. Faculties are rightly skeptical that political forces, especially those hostile to a perceived liberal bias in higher education will use MOOCs to steer students away from what they view as “effete” liberal arts courses. Another concern is that financial interests will steer taxpayer grants and student loans to maximize shareholder profits, at the expense of students, especially disadvantaged students. Pat McCrory, Governor of North

Carolina, stated on William Bennett's radio show "Funds for higher education should not be based on how many butts in seats but how many of those butts can get jobs" (Carlson "Payoff"). What is left unsaid, but understood, is that degrees in the liberal arts have a tenuous connection with the working world. It is an argument undermined by studies of lifetime earnings. Dennis P. Jones president of the National Center for Higher Education Management System said studies show "It's the students in the broader-based arts and sciences fields that end up in the CEO positions, but it takes a long time to get there" (Carlson "Payoff").

There are practical and historical reasons to be wary of MOOCs as an innovation. As Lawrence Bacow, President of Tufts remarked "if I went to my Board at Tufts and told them that I was purchasing an enterprise system on which the entire revenue stream depended, and that the vendor had been in business for less than a year and had no track record, revenue or business model, I suspect I would be fired. Yet some Boards are forcing Presidents to contemplate hugely consequential changes in strategy based on six months' worth of experience with a handful of MOOCs" (Bowen 94).

Adding to this practical concern is past experience with earlier attempts at distance learning. Radio, television and correspondence courses, some stretching back to the 18th century, have met with limited success. There is little evidence as of yet that MOOCs will be different. Two conflicting motives drove past attempts and they drive the current interest in MOOCs. One is a genuine desire to spread knowledge and offer learning opportunities as a democratic and moral principle. On the other hand, there is a market driven desire to educate millions of people on the cheap and make massive profits.

Distance Learning—A Storied History

The term MOOC entered the academic lexicon in 2008. The University of Manitoba in Canada offered a free online course in “Connectivism and Connective Knowledge.” The idea was inspired by the spirit of open courseware. The individual student is empowered to design a learning experience by leveraging the capabilities of social computing and shared information. To distinguish themselves from the later xMOOCs, these cMOOCs encourage students to be both learners and teachers (Ahn). Between 2008 and 2011, other institutions experimented with online classes. The first institution in the U.S. was the University of Illinois Springfield, with a prescient course called “Online Learning Today and Tomorrow.” Over 2500 students signed up (Sandeem). Meanwhile, new online education providers offering educationally-oriented courses appeared, such as Khan Academy started by former hedge fund manager Salman Khan, TED and iTunesU.

What propelled MOOCs into the forefront of education was an online course that debuted in December 2011 called “Artificial Intelligence.” Over 160,000 students from 190 countries signed up. Less than 10% finished the course. The author of the course was a Stanford professor, Sebastian Thrun. Thrun is a Board member of Google and well connected to the education-technology complex in Silicon Valley. He started a company, Udacity. By March 2013, it had raised \$21 million in venture capital (*The Chronicle of Higher Education* “Digital”). Another MOOC followed out of Stanford, Coursera, founded by Andrew Ng and Daphne Koller, with funding from venture capital heavy weights Kleiner Perkins Caufield and Byers. By May 2013, Coursera had partnered with 62 colleges. Harvard and MIT formed a non-profit MOOC, edX with \$60 million funding. In the U.K., Open University, a

long time and successful distance learning program, initiated a non-profit MOOC called FutureLearn. These MOOC platforms and other smaller ones have different approaches and goals that will be discussed in detail later.

MOOC Mania

The combination of prestigious institutions and highly regarded Silicon Valley venture capitalists set off a media tsunami. Columnists, reporters and opinion makers at major media outlets, entrepreneurs, investors and politicians heralded the coming of a new era in higher education. Not for the first time. As recently as the late 1990s and early 2000s investment bankers such as Goldman Sachs predicted that “e-Learning can deliver more value at less cost than traditional education. This competitive advantage, coupled with high-operating leverage for e-Learning companies, should translate into high margins and returns on capital in the industry” (Goldman Sachs). Hambrecht and Co stated: “Education is about to change fundamentally. Why? Because almost everything we know about education is up for grabs: the way it is funded, designed, managed and even delivered” (Hambrecht and Co). Of the 46 companies marked for success in 2000, only six were still in existence by 2010 and most had morphed into social network companies (Clarke).

Similar predictions of major impending changes in education accompanied the introduction of radio and television. History shows the influence of distance learning technologies on education has been peripheral at best, a teaching aid like a textbook often used by those with a background or recreational interest in the subject. None have succeeded in changing education. Why they failed has important ramifications for the future success of MOOCs.

Seeking Effective Distance Learning Solutions

Distance learning in the U.S. stretches back nearly 300 years. In 1728, an advertisement in the Boston Gazette by Caleb Phillips promoted weekly lessons in shorthand. The method of delivery was the postal service (Pandey). It took a while for the idea to catch on. One hundred and thirty years later, the University of London became the first mainstream institution to offer distance degrees; a forerunner of their International Program of post graduate degrees. Illinois Wesleyan University was the first U.S. University to instigate college-sponsored correspondence instruction in 1883. Shortly after, Chautauqua College of Liberal Arts of New York offered degrees. Independently at this time, correspondence courses in mine safety were developed for home study. In 1892, the first president of the University of Chicago, William Rainey Harper, with backing from John D Rockefeller, created a University Extension, offering courses to the surrounding communities and satellite colleges. When the project was abandoned in 1906, the University of Wisconsin picked up the baton as a way to provide vocational training to farmers. The Wisconsin Extension still exists today with more than 40,000 students enrolled in credit-bearing course work (Fishman).

The postal service was the major delivery system until the introduction of radio. Between 1921 and 1928 the number of radios in the United States increased from a few thousand to 10 million. By 1922, New York University had established a radio station, through which “virtually all the subjects of the university would be sent out” (Matt and Fernandez). Harvard, Columbia, Kansas State, Purdue, Tufts, and numerous other universities across the country established radio stations so that the “backwoods dwindle, if

not entirely disappear.” Students registered by mail, sent assignments to faculty to be graded. Between 1923 and 1940, thirteen institutions offered credit and nearly 10,000 enrolled. Only 17% finished the courses. By the 1940-41 academic year there was only one radio course for which students could earn credit and no-one enrolled.

Enthusiasm for distance learning revived in the 1950s with the advent of mass television viewing. In language reminiscent of recent MOOC proclamations, a Ford Foundation funded study reported, “Television had the power to drive down costs, enable collection of data on how students learn and extend the reach of superior teachers to greater numbers of students” (Delbanco). Like radio before it, what followed the initial excitement was disappointment, with one notable exception, the British Open University. Started by Britain’s Labour Party in 1971, it remains one of the largest universities in the world with an enrollment of 250,000 students (Fishman). Yet, only a small fraction of the enrolled students finish the courses.

The problems that emerged in previous distance learning attempts are some of the same ones that have appeared in MOOCs. Completion rates were low. Cheating casts doubt on the true worth of certificates. However, the major obstacle was neither radio nor television offered the opportunity for social interaction that aids in learning.

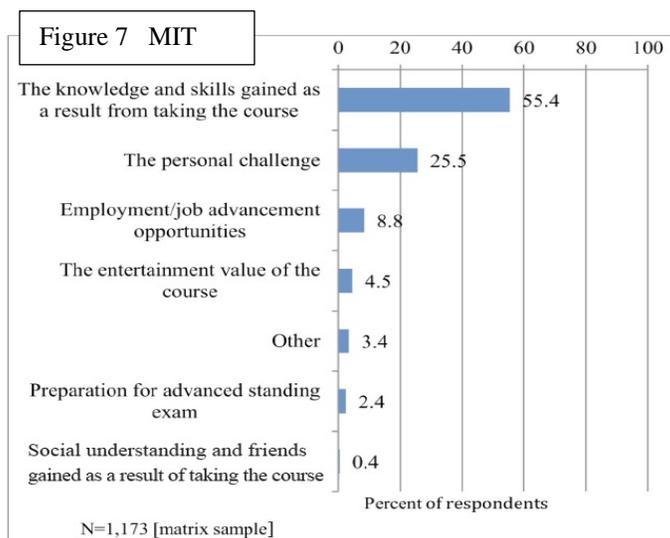
MOOCs do not suffer from the passive learning environment of radio and television, but wikis, discussion forums and blogs are not on par with face-to-face interaction. In a recent study, 42% of online community college students said they learned less online than in traditional face-to-face classes, and most said the online classes were harder (Winston).

Data mining MOOCs

One of the altruistic and nobler intentions of MOOCs and distance learning in general is that they offer opportunity to disadvantaged students due to background, circumstances or economics. The hope is that affordable online education can “level the playing field.” To understand the challenges faced by these students, education researchers need hard data on the learning habits of students in distance learning programs. Unlike earlier efforts to embed technology into education, education researchers now have a very powerful tool to study the behavior of distance learning students. The data mining capabilities of MOOCs give educators a far more granular picture of what works and what does not.

EdX, Udacity and Coursera have over six million enrollees. The MOOC platforms are capable of tracking every student’s click, store data on how and when instructional resources are used, analyze the nature of social interaction and much more (Breslow et al.).

A team of researchers from MIT led by Lori Breslow analyzed the data from the first course offered by edX, “Circuits and Electronics.” The course began in March 2012 and ended in June 2012. 155,000 students from 194 countries registered. The top five countries were the U.S. (26,333), India (13,044), U.K. (8,430), Columbia (5,900) and Spain (3,684).



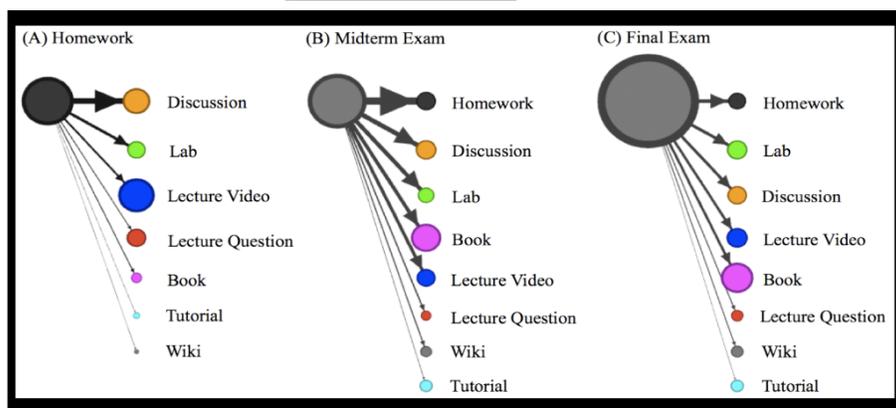
Most registrants were in their twenties and thirties. 65% already had a bachelors or master’s degree. Instead of attracting the hoped for disadvantaged students, the MOOC attracted mostly competent accomplished students. Further, the

goals of 86% of the students in the course can be characterized as personal satisfaction and improvement. A mere 8.8% of the students signed up to enhance job employment prospects (Figure 7).

The pedagogical approach of the MOOC consisted of short video lectures of 10 minutes or less with text, illustrations and equations drawn on a tablet. Between each video there were online exercises to put the concepts into practice. Text books were provided electronically, along with wikis and discussion forums. There were twelve homework assignments, a midterm and a final exam. Only 5% completed the course.

The researchers first analyzed when students came to online class. Not surprisingly, most came on weekends just before the homework deadline. Then, they analyzed how they

Figure 8 MIT



used their time

(Figure 8).

When doing

homework, most

time was spent

looking at the

lecture video and

then in discussion groups online. For exams, most time was spent reviewing homework and

online book readings. Only 3% of the registered students participated in the discussions

groups, those active on the discussion forum were mostly from the 5% of students who

completed the course. Of those who completed the course 27.7% asked a question, 40.6%

answered one and 36% made a comment. Students that completed the course were of all

ages and genders. The strongest correlation and the one most important with regard to using

MOOCs to help level the playing field for disadvantaged students was that, students who collaborated offline with a teacher, another registered student or had expertise in the area scored on average three points higher (Breslow et al.). A U.S. State Department pilot program, “MOOC Camp Initiative” undertaken with Coursera in Bolivia, Indonesia and South Korea showed that, 10% of students passed while taking the course online exclusively, but for those with teacher guidance that met for discussion once a week, the pass rate was 40% (Lewin “Global Network”).

San Jose State University students taking an Udacity MOOC in statistics confirmed that face-to-face interaction is important to improve academic performance. Eighty-two students took the course for online credit. Only half of the students taking the statistics course earned a passing grade, a lower pass rate than the face-to-face version. In December 2012, Sebastian Thrun, founder of Udacity was quoted as saying; he believed there would be only ten universities left in the world in fifty years (*The Economist* “Lessons”). Eight months later, the limitations of online MOOCs as an educational curative to the problems of higher education led to a more measured and realistic appraisal, “a medium where only self-motivated, web-savvy people sign up, and the success rate is 10%, doesn’t strike me quite yet as a solution to the problems of higher education” (Kolowich “Revolution”). This bears out work done by researchers at Columbia University’s Community College Research Center. Their studies show that online students at community colleges get lower grades and dropped out more often than those in regular classes (Clark).

From Euphoria to Reality

At their inception, MOOC providers identified accreditation and earning college credits as the main obstacle to their growth as a viable educational tool. Coursera has five

subjects for credit approved by the American Council on Education as part of a pilot (Clarke). Students can opt in for credit by paying a fee of \$128. There is no guarantee any school will accept the credit. Of the universities polled by *The Chronicle of Higher Education*, 72% said MOOCs did not deserve formal credit (*The Chronicle of Higher Education* “Minds”). Although this reticence may be partly an act of self-preservation; there are also major concerns about cheating, effectiveness, applicability and student support. In the fall of 2012, Colorado State University-Global Campus offered to award credit to students who performed well in an Udacity computer-science MOOC. There were no takers (Kolowich “Revolution”). Initial attempts at offering MOOCs for credit have met with little enthusiasm.

Traditional higher education prizes knowledge over facts, wisdom over skill, inspiration over discipline and insight over information (Bowen 141). In the research completed so far, there are anecdotal stories of inspirational achievement such as twelve-year-old Khadija Niazi from Pakistan. She told of her experience completing online courses from Udacity and Coursera, to the well-heeled attendees at the World Economic Forum in Davos, Switzerland. Ms. Niazi attests she is now interested in astrobiology and wants to be a physicist (Smale). But, those stories seem to be the exceptions that prove the rule: there is little compelling evidence that MOOCs on their own provide the educational virtues prized by traditional higher education. It should be noted, that most of the MOOCs offered are in Science, Technology, Engineering and Mathematics (STEM) courses. These courses by their scientific and mathematically nature tend to be factual and skill based.

The Economics of MOOC

The costs associated with creating a course range from thirty to fifty thousand dollars excluding faculty time, on average 200 hours in preparation and production. MOOC providers have been experimenting with different business models to see which is likely to produce revenue, the results of which led to an evolution in the goals and hopes for outcomes of the major MOOC players, Coursera, Udacity and edX.

Coursera

Coursera is largest of the MOOCs with 5 million subscribers (Coursera). They offer a platform for “name brand” universities—100 institutions as of November 2013. Coursera provides a platform, structure and support to deliver the institutional content. Their initial stated mission was to provide these courses to disadvantaged students, who had the option to pay a small fee for proctored exams and a certificate.

After studying MOOC students, Coursera realized that most of those finishing the course had already earned a degree (Kolowich “Credit Courses”). That is not where the problems are in higher education. Coursera hoped MOOCs would aid those trying to obtain entry to an undergraduate degree, help assuage issues such as student readiness, time to degree and dropout rates. MOOCs may still be part of a solution to alleviate those problems, but it will involve more than offering free courses online, as will be discussed later. If MOOCs are to be a viable business proposition they have to fill a need or provide a service that people are willing to pay for. One business approach tried was to charge a fee to firms looking to recruit promising Coursera students. That proved unsuccessful as employer’s needs were too varied (*The Economist* “Attack”).

In late May 2013, Coursera changed direction, recasting itself as a platform offering credit-bearing courses for students enrolled at multiple campuses in the public university system. The MOOC created by the university would be part of an “adopted” or guided course. Typically, Coursera would charge a university \$3000 for course development and then the university would produce the MOOC. The university pays Coursera \$25 per student for the first 500 registered, the per student fee declines to \$15 and finally \$8 as more students sign up. As the students enroll, instructors and teachers provide support. Ten public state universities systems signed up for the pilot. While Coursera hopes the MOOCs will see widespread usage across the entire university systems, the University of Kentucky, one of the signees, sees the use for the MOOC as a means to prepare high-school students for college-level work (Kolowich ‘Credit Courses”).

The approach taken by University of Kentucky is a positive step in the rebalancing of higher education brought about by the introduction of MOOCs. They have concluded that MOOCs can be a powerful tool to accurately assess the short-comings and abilities of incoming freshmen. This would give prospective students a choice, continue and take remedial classes to get up to speed, or change course choices. The idea could be extended to using MOOCs as “course trailers,” similar to how major film companies use trailers to tease upcoming movies. A half-hour sample of a course would be enough for a student to decide if they have the interest or the ability to handle the coursework. The cost of producing the MOOC could be offset by offering corporate sponsorships. For example, a MOOC course trailer in European History might be sponsored by an airline, a hotel chain or a European travel bureau.

Udacity

Prior to starting Udacity, Sebastian Thrun was renowned for his work in artificial intelligence and web applications. He created Google Maps, founded Google +, co-created Google Street View and is head of the Google self-driving car project. This background informs Udacity's mission to foster access and successful learning outcomes (Sandeen). At the start, Udacity focused on three areas of student achievement; high school students preparing for university entry, university students searching for interesting courses to obtain college credit and professionals wishing to update skills or shift careers. Udacity courses are concentrated in mathematics, web development and artificial intelligence. Unlike Coursera, they offer few courses, but there is a high design and planning component. The courses are highly interactive, with integrated feedback informed by short videos, quizzes and forums.

The disappointing outcome for the pilot course on statistics with San Jose State University halted the program, leading to rethinking and a change of focus. Their new mission and hope for a revenue stream takes a cue from FPCUs. They provide post-secondary courses in job training skills. In a direct challenge to FPCUs, Udacity will offer to train existing and future employees in the information technology market space. In January 2014, Udacity will be the platform for an online Master's degree in computer science at Georgia Tech with sponsorship from AT&T. If successful, the pilot program may well cripple or signal the death knell for many large FPCUs.

Georgia Tech announced the degree in late May 2013, with plans to enroll 10,000 students in the three year course, for which AT&T is providing \$2 million in sponsorships. AT&T will offer guest lecturers and make class project suggestions, provided there is agreement from the course professor. The cost per credit is \$134, instead of the normal rates

of \$472 per credit for in-state and \$1,139 per credit for out-of-state students (Young) . The estimated cost for a student to finish the degree is \$6,600, a fraction of the \$24,000 to \$56,000 paid in tuition and fees by students attending at the Georgia Tech campus. The university will receive 60% and Udacity 40% of revenues generated. By the third year, projected costs are estimated to be \$14.3 million with \$4.7 million in profits. The program will be free on the Udacity website. If an online student wants credit, they have to apply for admission to Georgia Tech and pay the online tuition fee. Those accepted will get access to teaching assistants hired and paid for by Udacity and may have some of their assignments graded by real people. Students taking exams will be proctored at one of the 4000 sites run by Pearson VUE.

The Master's degree stirred opposition within Georgia Tech. Benjamin Flowers, chair of the graduate curriculum committee says, "at no point has he or his colleagues been given to review, any written proposal for a new graduate program" (Kolowich "Revolution"). If it does proceed as planned, it will be closely monitored in business and education circles. AT&T views the project as a necessary component to supply a constant flow of highly trained IT professionals. Bruce Chaloux of the Sloan Consortium, an advocacy group for online education is more skeptical as to its business viability, saying that; "When the underwriting ends, to keep the high quality, Georgia Tech would have to float more traditional tuition rates" (Lewin "New Frontier").

In a little over six months, Coursera and Udacity have moved from open online education providers to education platforms providing technology and services. These are services already provided to higher education by companies such as Blackboard, Desire2Learn and Instructure. Blackboard and Canvas provide MOOC platforms for

universities to run their own courses. Other services being considered by Coursera and Udacity such as automated coaching and grading software are product offerings already offered by the likes of McGraw-Hill and Pearson.

edX

Of the three major MOOC providers only edX is a non-profit concern, funded by Harvard and MIT. At some point, edX has to create an income stream; but for now the main focuses of their MOOC platform is data mining for educational research and partnering with elite domestic and overseas universities to develop imaginative courses and approaches. In September 2013, edX announced a tie-up with Google to create an open source platform, Mooc.org that will host independent content from professors, institutions and businesses. Anant Agarwal, president of edX, described its purpose as, “We envision that the site will become an ideal way to develop and refine novel online learning experiences.” The partnership plans to utilize Mooc.org as an open innovation site for development of out-of-the-box creative approaches that may be incorporated into the main edX site. “Moreover, we will be able to learn how to improve our platform by having more individuals build and use content” stated Agarwal (edX). These expansion plans are not limited to the United States; China chose the edX platform for its new online learning portal, Xuetaangx, as have the French higher education ministry and the International Monetary Fund.

The Political and Diplomatic Uses For MOOCs

In October 2013, Coursera announced a partnership with the US State Department to create a world-wide network of learning hubs using MOOCs tied to local education facilities. The program is part of the State Department’s “MOOC Camp Initiative,” active in 40 countries involving edX and other MOOC platform providers. The initiative is a diplomatic

tool with the stated purpose to, “help meet the aspirations of young people around the world, and offer skills and knowledge that they can use to succeed in life” (US Department of State). Its other stated purpose is to promote American higher education and according to Meghann Curtis of the State Department spur in some students “A desire to study in the United States” (Lewin “Global Network”). In a global economy, America is competing against other industrialized and emerging economies to attract the brightest and the best students, and maintain its technological and economic edge. MOOCs from highly regarded American colleges are in effect being used as outreach and marketing tools for economic development couched in soft sell diplomatic good-will.

Discussion

The pilot projects and research undertaken by Coursera, Udacity and edX indicate that technology alone cannot solve the complex problems facing higher education. MOOCs are not a replacement for bricks and mortar universities. They are a valuable teaching aid for competent students. They grant students a degree of flexibility, and are especially useful for working adults with limited time. On a pedagogical level, MOOCs allow for a ‘flipped classroom.’ The lecture becomes homework and the classroom becomes a place for collaboration and discussion. These are positive, worthwhile improvements in the traditional higher learning environment, as they will likely increase the performance of students’ communication and critical thinking skills. However, in their present form MOOCs cannot help disadvantaged students from poor backgrounds become university scholars, if they have not had the right preparation in their elementary and secondary schooling.

The crisis facing universities and community colleges goes much deeper, to the foundations of what constitutes a liberal education in the 21st Century. The role MOOCs can

play in correcting these problems is not to revolutionize the pedagogy from campus to online, but to provide insights on how different students learn, target what is lacking in their understanding, identify their talents, and permit a more flexible approach to the need for lifelong learning.

The Reevaluation of Higher Education Values

The question asked by this paper is, will MOOCs create greater opportunity or inequality? If MOOCs are used as a means to reduce the costs of higher education, downsizing staff, closing down colleges and universities, expecting students to study in cyberspace, research shows it will lead to fewer students graduating (Clark). These students with no credentials or marketable skills will not find well-paying employment. However, if MOOCs are used as part of a blended learning experience, allowing “flipped classrooms,” flexible instruction combined with staff teaching and guidance, it will lead to marginal improvements in the drop-out rates and time to completion (Sandeem). Where Massive Open Online Courses can provide the greatest educational benefit is in the data they provide to education researchers and policy makers.

MOOCs allow researchers to study how different students learn and succeed. From that information, higher education can be transformed to one where those without an academic aptitude or interest can excel with a vocational or technical education, then lead productive lives.

Research on the data mined from students taking MOOC courses has confirmed what earlier studies have concluded: “College for All” might be a mantra, but the hard reality is fewer than one in three young people achieve this dream” (Harvard Graduate School of Education). That conclusion from the influential report “Pathways to Prosperity”, by the

Harvard Graduate School of Education is significant because, it is a refutation of a key premise for higher education created by Harvard and copied by universities across the U.S. In brutal terms, the authors state that the mantra, “College for All,” needs to broaden to become “post high school credentials for all.” They drive home this point with two sobering statistics:

- “The U.S. now has the highest college dropout rate in the industrialized world.”
- “27 percent of people with post-secondary licenses or certificates—credentials short of an associate’s degree—earn more than the average bachelor’s degree recipient.”

The latter statement accounts for the spectacular growth of For-Profit Colleges and Universities. They provide the educational training for students to earn these certificates. It is this market, currently generating \$28 billion annually, that can turn MOOC providers like Udacity into viable businesses and bring in new revenue streams to universities and colleges. There are well paying career opportunities for middle-skilled professionals such as electricians, dental hygienists, paralegals, robotic technicians and electronic medical record keepers. According to the Bureau of Labor Statistics by 2018, there is a projected need for 1.4 million new healthcare professionals, including over 150,000 registered nurses and 99,800 pharmacy technicians (Bureau of Labor Statistics). Applicants for these jobs require an associate’s degree or equivalent certification. None of these well-paying careers require taking a four-year college degree.

Many students who successfully completed a four-year degree find they cannot get a job because they lack relevant work experience. The best way students can obtain work experience is through work-study internships.

What the “College for All” ideology seeks to disguise is that different subgroups and classes have different aptitudes and interests. Obtaining a degree carries a cache, an acknowledgement by experts that the graduating student has above average abilities. The difficulty arises when the student population does not match the demographics of the state. At the University of California in San Diego, 44% of the student body is Asian, at UCLA the figure is 34% and UC Berkeley 43% respectively.² Non-Hispanic Whites account for just 23%, 29% and 24% respectively of the student body. However, Non-Hispanic Whites make up 42.3% and Asians make up just 13.6% of the population in California. In 2008, Asians/Pacific Islanders represented 50% of the foreign-born faculty employed full-time at Universities in the United States and 62% of the foreign-born doctorate holders with post doc appointments in science and engineering (NSF “Indicators 2012”). The only reasonable conclusion drawn from statistics like these is that Asians as a group are more suited to the academic environment especially in science and engineering than Non-Hispanic Whites as a group, who in turn are more adept than other groups. This reality offends the deep-rooted ideological belief that all groups have the same aptitudes for academic subjects. The price for this ideological position is paid by both teachers and students. Teachers are put under pressure to help failing students, standards are dropped to give the appearance of equity and academic excellence is compromised. Students without the motivation, aptitude or interest enroll in college courses, find the work exceeds their capabilities or desire to master and drop-out. Others leave because they see no connection between the college classes and a career or they are bored and have no interest (Harvard Graduate School of Education). These students are left without qualifications, in debt with no prospects, all to satisfy an idealistic

² Percentage taken from University of California sites
<http://opa.berkeley.edu/statistics/enrollmentdata.html>, <http://studentresearch.ucsd.edu/files/stats-data/profile/Profile2012.pdf>, http://www.aim.ucla.edu/tables/enrollment_demographics_fall.aspx

political ideology. The “Pathways to Prosperity” study states a hard truth “after 20 years of effort, and billions of dollars of expenditure, the time has come for an honest assessment” (Harvard Graduate School of Education). There are other advanced western countries where education systems exist and that assessment can be made.

Restructuring Education

In his 2013 State of Union speech, President Obama said “Let’s also make sure that a high school diploma puts our kids on a path to a good job. Right now, countries like Germany focus on graduating their high school students with the equivalent of a technical degree from one of our community colleges, so that they’re ready for a job” (Strauss). A few years earlier, Tony Blair, then Prime Minister of the U.K. asked Angela Merkel, Chancellor of Germany, what was the secret of her countries’ success; Chancellor Merkel replied “we still make things.” A simple lesson both the U.S. and the U.K. ignored. American industry moved offshore, claiming that it could not manufacture in the U.S. and make a profit and pay U.S. wage rates. Yet, Germany manages to do just that (Hill). The U.S. Bureau of Labor Statistics figures show that the hourly manufacturing compensation (wages plus benefits) is \$48 in Germany and \$32 for the U.S. In addition, Germans have longer vacations, paid paternity and maternity leave, free healthcare and shorter working hours.

The critical loss is in industry sector know-how and the opportunity for employees to update their skills as new innovations and technologies come online, and for graduates to gain valuable work experience. While the U.S. economy experiences persistent high youth unemployment, American business is lobbying Congress to allow more immigrants in to fill high paying jobs most notably in IT.

The Northern European Higher Education Model

Throughout northern and central Europe vocational education and training is the mainstream education system, the pathway helping most young people make the transition to productive adulthood (Harvard Graduate School of Education). Between 40-70% of young people choose vocational education that combines classroom and workplace apprenticeship to earn a diploma or certification.

Germany separates the academic from the practical. High school aged students attend one of four distinct types of schools: Hauptschule (vocational schools), Gymnasium for students intending to go to university, Realschule for intermediate students, a Gesamtschule, similar to U.S. high schools. From there students attend a Berufsschule, a vocational school tied to a particular industrial specialty, or the student goes to university. In 2000, only 11% of German high school aged students went on to university. In the U.S., according to the National Center for Higher Education Management 36.2% enrolled in college. The dropout rate for German universities is 20% as opposed to 48% in the U.S. A significant difference in German universities is that like for-profit U.S. universities, professors spend the majority of their time teaching as opposed to doing research. Research happens at specialized centers such as the Max Planck Institute.

Germany has an apprenticeship system that leads to 350 different occupations. Employers play a major role in defining and paying for work-based learning. They believe the best way to get a highly qualified workforce is to invest in the development, training and socialization at the workplace (Harvard Graduate School of Education). The results speak for themselves; Germany is a high wage, high quality producer with low unemployment, a high standard of living and quality of life. Similar systems in Switzerland, Austria and the

Scandinavian countries produce similar outcomes. The top five countries listed by the OECD better life index for life satisfaction are in descending order; Switzerland, Norway, Iceland, Sweden and Denmark (OECD Better Life Index). What all these system have in common is that they offer multiple pathways for students to choose or be assigned careers that are best suited to their abilities.

The Future for MOOCs in Higher Education

The United States is a nation of many different groups with a wide range of abilities. New pathways are needed for teens to apply these diverse talents and transition to worthwhile careers. Many of those careers will start in vocational programs offered by colleges and sponsored by industry. Education in the 21st Century will no longer be restricted to four years of college; it will be a lifelong process. MOOCs will play an important role by:

- Providing flexibility for working adults
- Moving classroom pedagogy from passive instruction to interactive critical thinking and discussion.
- Providing the data for experts to show what works and why, offering opportunities to create new revenue streams for MOOC providers, professors, community colleges and universities.
- Aiding in life-long learning

The visual interactive capabilities of the MOOC technology make subjects more interesting and appealing, improving understanding in the process. Most importantly, it will enrich the educational and classroom experience for both faculty and students. MOOCs provide a vehicle to shift the passive, one way focus in the classroom, to one of create and

collaborate (Scholz). In the 21st Century, post-secondary institutions will gradually progress towards “personalized” education, shifting the focus to process and away from product (Irvine).

MOOCs will have their greatest impact in STEM subjects, as attested by the success in the use of online media such as Code Academy and by FPCUs providing training for IT company employees. Liberal arts have less need for MOOCs. They benefited from years of high quality audio-visual media. Films, theater plays, documentaries, concerts and television series have brought historical subjects, literary and musical classics to millions. From a financial and creative perspective, MOOC providers cannot compete with the story telling abilities of producers from PBS, BBC or with major stage and film directors. Audiences watch to be entertained, but also want self-improvement. Many of these programs and series are used as educational aids, available in college libraries.

Aside from their value as instructional aids in STEM subjects for vocational training, there are many uses MOOCs can be put to that can enrich and revitalize higher education.

MOOCs and Lifelong Learning

Higher education institutions view their main mission to educate students for four-to-six years until they graduate and seek work. That mission has to be extended to facilitate lifelong learning. Universities and colleges need to provide instruction from high school to the tomb. It begins with screening prospective applicants. SAT scores and high school grades are the predominant deciding acceptance-criteria at most institutions. MOOCs can provide a more detailed and helpful picture to select students and guide them in the best course selection and most suitable pathways according to their abilities. Recall that the

University of Kentucky wants to use the MOOCs to see what is lacking in students applying for college courses.

For a freshman entering college, there is a broad palette of course choices, but little to guide the student as to content. Short sponsored MOOC trailers of a course, what it contains and the level of work required will inhibit students from signing onto classes they later have to drop. This should reduce dropout rates, help shorten the time to degree completion and reduce student debt. Instead of a broad palette of subjects, students interested in a vocational pathway can focus on those subjects that complement their targeted career path and interests, allowing time to take internships or apprenticeships. Some of these pathways will lead to certificates, others to associate and bachelor degrees.

Media appointment viewing, watching or listening to a show at a specific time is in terminal decline. A viewer can now watch online at the media provider's website, on sites such as Hulu.com, or download a podcast when they want. Attending at colleges lectures at an appointed time faces a similar prospect. Instead of the current pedagogy in which a student takes notes as the teacher expounds, a student in their own time will watch the MOOC for a class and show up in person, or by video conference to discuss and ask questions raised by the video with instructors and classmates. Called a "flipped" classroom, this arrangement increases student-teacher interaction. Because a student has time to view, reflect and revisit if necessary, it enriches both the students' and teachers' classroom learning environment. Students with questions or issues on the subject matter develop their communication and critical skills thinking. Sharing insights benefit students through peer-to-peer learning. The classroom becomes collegial. Using MOOCs as part of a flexible classroom, blended learning experience prepare students for courses they must take as part of

their lifelong learning and career development. For-Profit Colleges and Universities fill the need for post graduate lifelong learning. Community colleges and college extensions can provide a more cost effective higher quality alternative. Most of the training and certification relates to specific tasks in the workplace. Thus, employer sponsorship is a source of income, as the pilot project between ATT/Georgia Tech and Udacity hopes to demonstrate. Since a sizeable and growing number of these students are working adults, MOOCs can provide a degree of flexibility needed to both work and study. When universities and colleges assume these responsibilities, it is in the interest of those businesses to support the academic institution by way of additional donations, grants and reimbursed tuition, as well as to supply equipment and company know-how. This collaboration can only strengthen and benefit the local community and provide additional financial benefit to the college.

For all students, but especially for those from disadvantaged backgrounds with gaps in their pre-requisite knowledge, traditional colleges with a choice of academic or vocational pathways can offer a broad range of remedial help not available at FPCUs, reducing the high dropout rate currently experienced at FPCUs. These new pathways and courses in no manner reduce the college's standards; rather they enhance the institutions as places of multi-level lifelong learning.

Liberal Arts Colleges

The Liberal Arts are the repository of human experience, wisdom and knowledge. For adults advanced in their careers, further education in the liberal arts becomes a necessity to round-out their development as cultivated, educated modern people.

When students graduate and go to work for a company, their main focus is learning and applying the skills needed for specific tasks. As they progress through their careers, they

take on additional responsibilities, their horizons broaden. Responsibilities can include international travel, meetings with influential business people, investors and politicians, having to engage in convivial and informed conversation, or needing to learn a foreign language or a country's history. A liberal arts advanced degree prepares them for these challenges. The one thing that these rising professionals do not have is time. What they want is a liberal arts advanced degree course using MOOCs as a "flexible" classroom with appointed times for meetings instructors, either in person or by video conference. This semi-personalized advanced liberal arts education comes with a high price tag, one many companies will willingly spend to assure their executives have all the necessary "firepower" to close deals and expand business. For liberal arts colleges this market sector can be a source of substantial financial benefit. To be effective, liberal arts colleges have to study market demands, match them to specific faculty talents and organizational strengths, construct a curriculum, then brand and market it to the targeted constituents.

Branding and Marketing Flexible Classrooms

Traditional universities and colleges, with the exception of Ivy League and elite universities predominantly serve state and local residents. However, the capabilities of colleges in a connected world permit a much wider net to be cast. In an age of life-long learning, it is not the location but the college offerings that matter most. To reach out beyond state boundaries to a world-wide audience means that colleges have to devote time and resources to marketing and branding their unique educational experience. MOOCs and sample MOOCs of courses are one means for colleges to contact prospective students. This is one of the goals of the U.S. State Department "MOOC Initiative." Free MOOCs provided by the edX, Coursera and Udacity and other platforms are marketing and outreach vehicles

for the respective universities to attract exceptional or wealthy overseas students and promote their faculty.

Catering to prospective students means first identifying the educational needs of different market segments. The model for higher education developed in the twentieth century adopted a “supermarket” approach to course choice, a one-stop shopping for the educational undergraduate experience. The twenty-first century model will be more differentiated and focused. The customers for educational services have very different needs. It is not economically feasible for most colleges and universities to be all things to all people. Colleges and universities must decide on the segments of the life-long educational process that are best suited to their strengths.

Conclusion

So will MOOCs create greater opportunity or inequality? If used as a means to reduce the costs of higher education, by replacing faculty, research shows it will result in fewer students from disadvantaged backgrounds performing well in college and lead to greater societal inequality. On the other hand, MOOCs offer many opportunities to improve higher education in America and overseas.

MOOCs provide a means to evaluate how students learn and what are their strengths and weaknesses. They allow new pedagogies such as the “flipped classroom” and greater flexibility. Through the use of MOOCs, universities and colleges now have a global interactive outreach capability as centers for life-long learning. For some in academia, MOOCs may be a path to fame and greater financial rewards, for universities and colleges a source of new revenue streams. Their most lasting contribution may be found in their value

as a learning aid, part of a restructured higher education system designed to serve the societal needs of the 21st century.

Appendix

AR	THE WORLD UNIVERSITY RANKINGS	QS
1 Harvard	1 Caltech	1 MIT
2 Stanford	2 Oxford	2 Harvard
3 University of California at Berkeley	2 Stanford	3 Cambridge
4 MIT	4 Harvard	4 University College London
5 Cambridge	5 MIT	5 Imperial College London
6 Caltech	6 Princeton	6 Oxford
7 Princeton	7 Cambridge	7 Stanford
8 Columbia	8 Imperial College London	8 Yale
9 University of Chicago	9 University of California at Berkeley	9 University of Chicago
10 Oxford	10 University of Chicago	10 Caltech
11 Yale	11 Yale	10 Princeton
12 University of California at Los Angeles	12 Swiss Federal Institute of Technology Zürich	12 Swiss Federal Institute of Technology Zurich
13 Cornell	13 University of California at Los Angeles	13 University of Pennsylvania
14 University of California at San Diego	14 Columbia	14 Columbia
15 University of Pennsylvania	15 University of Pennsylvania	15 Cornell
16 University of Washington	16 Johns Hopkins	16 Johns Hopkins
17 Johns Hopkins	17 University College London	17 University of Edinburgh
18 University of California at San Francisco	18 Cornell	17 University of Toronto
19 University of Wisconsin at Madison	19 Northwestern University	19 Federal Polytechnic School of Lausanne
20 Swiss Federal Institute of Technology Zurich	20 University of Michigan at Ann Arbor	19 King's College London
21 University of Tokyo	21 University of Toronto	21 McGill University
21 University College London	22 Carnegie Mellon University	22 University of Michigan at Ann Arbor
23 University of Michigan at Ann Arbor	23 Duke University	23 Duke University
24 Imperial College London	24 University of Washington	24 National University of Singapore
25 University of Illinois at Urbana-Champaign	25 University of Texas at Austin	25 University of California at Berkeley
26 Kyoto University	25 Georgia Institute of Technology	26 University of Hong Kong
27 New York University	27 University of Tokyo	27 Australian National University
28 University of Toronto	28 University of Melbourne	28 École Normale Supérieure
29 University of Minnesota-Twin Cities	29 National University of Singapore	29 Northwestern University
30 Northwestern University	30 University of British Columbia	30 University of Bristol
31 Duke University	31 University of Wisconsin at Madison	31 University of Melbourne

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